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EXAMINER	
NGUYEN, LEON VIET Q	
ART UNIT	PAPER NUMBER
2611	

NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/511,759	PAJUKOSKI, KARI	
	Examiner	Art Unit	
	LEON-VIET Q. NGUYEN	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 September 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-41* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *19-21,29-34 and 36-38* is/are allowed.

6)☒ Claim(s) *1-18,22-28,35 and 39-41* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *19 October 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This office action is in response to communication filed on 9/25/09. Claims 1-41 are pending on this application.

Response to Arguments

2. Applicant's arguments with respect to claims 1-41 have been considered but are moot in view of the new ground(s) of rejection.

3. Applicant's arguments with respect to the rejection(s) of claim(s) 39-41 under 35 USC 101 and 35 USC 112 1st paragraph have been fully considered but they are not persuasive.

Response to Remarks

Re claims 39-41, applicant asserts that the claims recite statutory subject matter (Remarks page 21 second paragraph).

Examiner respectfully disagrees.

The original specification fails to describe or limit the meaning of "a computer-readable medium encoded with a computer program". It is well known in the art that electromagnetic signals are a type of computer-readable medium capable of being encoded with instructions, algorithms, etc. However electromagnetic signals are not statutory subject matter (See 35 USC 101 Interim Guidelines Annex IV (a)). Therefore, the claims as currently written recite possible non-statutory subject matter. The

examiner suggests that the applicant amend the claim to clarify that the computer-readable medium is non-transitory.

Re claims 1-3, 18, 35, and 39-41 applicant asserts that the combination of Hiramatsu, Hunton and Chang fail to teach determining an error signal using the signal and the limiting signal by changing the limiting signal so as to be of an opposite sign and reducing from the signal (Remarks page 27 first paragraph, page 31 first paragraph, and page 34 first paragraph).

Examiner agrees however the argument is moot in view of the new grounds of rejection below.

Claim Rejections - 35 USC § 101

1. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 39-41 are rejected under 35 U.S.C. 101 because the claimed invention is directed to **non-statutory** subject matter. Claims 39-41 are directed to "**a computer readable medium encoded with a computer program**". According to the USPTO Interim Guidelines for Patent Subject Matter Eligibility, computer programs are neither computer components nor statutory processes, as they are not "acts" being performed nor do they define any structural and functional interrelationships between the computer program and other claimed elements of a computer which permit the computer program's functionality to be realized.

¶0092 of the published application states that the invention is implemented in software. Therefore claims 39-41 are interpreted to be computer programs representing computer listings per se and are considered non-statutory subject matter. See 35 USC 101 Interim Guidelines Annex IV (a).

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 39-41 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. A computer program product embodied on a computer-readable medium was not disclosed in the specification.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1, 4-6, and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hiramatsu (US6701163) in view of Hunton (US20030026351) and Takada (US20020196876).

Re claim 1, Hiramatsu teaches a method comprising:

determining, at a processor (fig. 4), a limiting signal (the outputs from filters 110 and 111 in fig. 4) from a signal (transmission signals A-C in fig. 4) filtered using a pulse shaping filter (filters 110 and 111 in fig. 4, col. 4 lines 55-67, the filters perform band restriction),

determining an error signal (components 113 and 114 in fig. 4, col. 8 lines 5-12 and lines 48-54. The absolute value of the difference is interpreted to correspond to an error value) using the signal and the limiting signal (col. 8 lines 48-54, the amplitudes of the transmission signal before and after the time),

generating a limited signal (the analog transmission signals output from D/A 121 and 122 in fig. 4).

Hiramatsu fails to explicitly teach generating a limited signal by reducing an error signal filtered using the filter matched to a chip pulse waveform from the signal. However Hunton teaches generating a limited signal (S' in fig. 3) by reducing (combiner 130 in fig. 3. ¶0077 of applicant's published application states that a summer is used to perform reduction. The combiner is interpreted to perform the same function as a summer) an error signal (V_C in fig. 3, ¶0024) filtered using the filter matched to a chip

pulse waveform (matched correction filter 170 in fig. 3, ¶0024) from the signal (the output of delay 120 in fig. 3).

Therefore taking the combined teachings of Hiramatsu and Hunton as a whole, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the step of Hunton into the method of Hiramatsu. The motivation to combine Hunton and Hiramatsu would be to provide signal-peak suppression (¶0022 of Hunton).

Hiramatsu also fails to teach changing the limiting signal so as to be of an opposite sign and reducing from the signal. However Takada teaches changing the sign of a limiting signal (the output of 63b in fig. 16 is interpreted to be a limiting signal which has its sign revered by 64a, ¶0085) and subtracting it from an input signal (¶0088) to obtain an error signal (¶0088, eI(t)).

Therefore taking the combined teachings of Hiramatsu and Takada as a whole, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the step of Takada into the method of Hiramatsu. The motivation to combine Takada and Hiramatsu would be to remove interference (¶0090 of Takada).

Re claim 4, the modified invention of Hiramatsu teaches a method wherein the signal is a baseband signal (col. 4 lines 15-19 of Hiramatsu, the in-phase and orthogonal signals are baseband signals).

Re claim 5, the modified invention of Hiramatsu teaches a method wherein the limiting signal is a baseband signal (the output from filters 110 and 11 in fig. 4 of Hiramatsu are in-phase and orthogonal signals, interpreted to be baseband signals).

Re claim 6, the modified invention of Hiramatsu teaches a method wherein the error signal is a baseband signal (col. 8 lines 48-61 of Hiramatsu, since the transmission signal is a baseband signal the output of calculation section 114 is also interpreted to be a baseband signal).

Re claim 39, the claimed limitations recited have been analyzed and rejected with respect to claim 1.

6. Claims 2, 12-14, 18, 22-24, 35, and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hiramatsu (US6701163) in view of Chang (US6628605) and Takada (US20020196876).

Re claim 2, Hiramatsu teaches a method comprising:

determining, at a processor (fig. 4), a limiting signal (the outputs from filters 110 and 111 in fig. 4) from a signal (transmission signals A-C in fig. 4) filtered using a pulse

shaping filter (filters 110 and 111 in fig. 4, col. 4 lines 55-67, the filters perform band restriction),

determining an error signal (components 113 and 114 in fig. 4, col. 8 lines 5-12 and lines 48-54. The absolute value of the difference is interpreted to correspond to an error value) using the signal and the limiting signal (col. 8 lines 48-54, the amplitudes of the transmission signal before and after the time),

generating a limited signal (the analog transmission signals output from D/A 121 and 122 in fig. 4) by reducing an error signal filtered using the filter matched to a chip pulse waveform from the signal (col. 8 lines 13-24).

Hiramatsu fails to teach orthogonalizing the error signal. However Chang teaches orthogonalizing an error signal (col. 9 lines 1-3, the difference signal 420 is interpreted to be an error signal) and reducing the error signal using a filter (BPF 440 in fig. 4B).

Therefore taking the combined teachings of Hiramatsu and Chang as a whole, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the step of Chang into the method of Hiramatsu. The motivation to combine Chang and Hiramatsu would be to efficiently transmit signals (col. 3 lines 32-34 of Chang).

Hiramatsu also fails to teach changing the limiting signal so as to be of an opposite sign and reducing from the signal. However Takada teaches changing the

sign of a limiting signal (the output of 63b in fig. 16 is interpreted to be a limiting signal which has its sign revered by 64a, ¶0085) and subtracting it from an input signal (¶0088) to obtain an error signal (¶0088, eI(t)).

Therefore taking the combined teachings of Hiramatsu and Takada as a whole, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the step of Takada into the method of Hiramatsu. The motivation to combine Takada and Hiramatsu would be to remove interference (¶0090 of Takada).

Re claim 12, the modified invention of Hiramatsu fails to explicitly teach a method wherein orthogonalization is carried out by minimizing the equation as claimed. However, the technique of minimizing an equation is well known to those of ordinary skill in the art. Furthermore, in ¶0048-¶53 of applicant's specification, it is stated that the mathematical technique as claimed is known and in accordance with prior art.

Re claim 13, the modified invention of Hiramatsu teaches a method wherein the orthogonalizing the error signal utilizes unused codes (col. 9 lines 1-5 of Chang, it would be obvious to assign unused orthogonal codes to avoid interference with various users).

Re claim 14, the modified invention of Hiramatsu teaches a method wherein the orthogonalizing the error signal utilizes codes used at a lower modulation level (col. 9 lines 41-45 of Chang, the codes can be reused. It would be obvious to have the codes previously used at a different modulation level. Se col. 5 lines 52-55 of Chang).

Re claim 18, the claimed limitations recited have been analyzed and rejected with respect to claim 2. It would be necessary to have an apparatus to perform the method as claimed in claim 2. Furthermore, the modified invention of Hiramatsu teaches a means for filtering the limited signal using the pulse shaping filter (BPF 440 in fig. 4B of Chang).

Re claim 22, Hiramatsu teaches wherein the signal is a baseband signal (col. 4 lines 15-19 of Hiramatsu, the in-phase and orthogonal signals are baseband signals).

Re claim 23, Hiramatsu teaches wherein the limiting signal is a baseband signal (the output from filters 110 and 11 in fig. 4 of Hiramatsu are in-phase and orthogonal signals, interpreted to be baseband signals).

Re claim 24, Hiramatsu teaches wherein the error signal is a baseband signal (col. 8 lines 48-61 of Hiramatsu, since the transmission signal is a baseband signal the output of calculation section 114 is also interpreted to be a baseband signal).

Re claim 35, the claimed limitations recited have been analyzed and rejected with respect to claim 18.

Re claim 40, the claimed limitations recited have been analyzed and rejected with respect to claim 2.

7. Claims 3, 15-17, and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hiramatsu (US6701163) in view of Ozluturk et al (US20050213691) and Takada (US20020196876).

Re claim 3, Hiramatsu teaches a method comprising:

combining, at a processor, at least two signals modulated onto different carriers to a combination signal (multiplexing 107 in fig. 4, it would be obvious to have the signals modulated on different carriers);

determining, at a processor (fig. 4), a limiting signal (the outputs from filters 110 and 111 in fig. 4) from a signal (transmission signals A-C in fig. 4) filtered using a pulse

shaping filter (filters 110 and 111 in fig. 4, col. 4 lines 55-67, the filters perform band restriction),

determining an error signal (components 113 and 114 in fig. 4, col. 8 lines 5-12 and lines 48-54. The absolute value of the difference is interpreted to correspond to an error value) using the signal and the limiting signal (col. 8 lines 48-54, the amplitudes of the transmission signal before and after the time),

generating a limited signal (the analog transmission signals output from D/A 121 and 122 in fig. 4) by reducing an error signal filtered using the filter matched to a chip pulse waveform from the signal (col. 8 lines 13-24).

Hiramatsu fails to teach dividing the error signal onto different carriers in a predetermined manner. However Ozluturk teaches dividing an error signal (signal 39 in fig. 2, ¶0029) onto different carriers (signal 47 is divided into the I and Q portions in fig. 2, ¶0008, it is well known that in-phase and quadrature components are transmitted on different carriers).

Therefore taking the combined teachings of Hiramatsu and Ozluturk as a whole, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the step of Ozluturk into the method of Hiramatsu. The motivation to combine Ozluturk and Hiramatsu would be to correct amplitude imbalance (¶0013 of Ozluturk).

Hiramatsu also fails to teach changing the limiting signal so as to be of an opposite sign and reducing from the signal. However Takada teaches changing the sign of a limiting signal (the output of 63b in fig. 16 is interpreted to be a limiting signal which has its sign revered by 64a, ¶0085) and subtracting it from an input signal (¶0088) to obtain an error signal (¶0088, eI(t)).

Therefore taking the combined teachings of Hiramatsu and Takada as a whole, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the step of Takada into the method of Hiramatsu. The motivation to combine Takada and Hiramatsu would be to remove interference (¶0090 of Takada).

Re claim 15, the modified invention of Hiramatsu teaches a method wherein the dividing of the error signal is carried out according to carriers (fig. 2 of Ozluturk, error reference signal 39 is divided into the I and Q portions which are well known to be on different carriers).

Re claim 16, although the modified invention of Hiramatsu fails to explicitly teach a method wherein the error signal is divided equally between different carriers, it would be a designer's choice how to partition an error signal.

Re claim 17, the modified invention of Hiramatsu teaches a method wherein the error signal is divided between different carriers in relation to the power or amplitude values to be clipped (¶0030 of Ozluturk).

Re claim 41, the claimed limitations recited have been analyzed and rejected with respect to claim 3.

8. Claims 7-10 and 25-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hiramatsu (US6701163), Hunton (US20030026351) and Takada (US20020196876) in view of McGowan et al (US20020012403).

Re claim 7, the modified invention of Hiramatsu fails to teach a method wherein the limiting signal is determined by means of a threshold value set for the power or amplitude values.

However McGowan teaches wherein a limiting signal (¶0034, a scaling factor) is determined by means of a threshold value set for the power (power regulator 208 in fig. 2, ¶0028) or amplitude values.

Therefore taking the combined teachings of Hiramatsu, Takada and Hunton with McGowan as a whole, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the step of McGowan into the method of Hiramatsu, Takada and Hunton. The motivation to combine McGowan, Takada,

Hiramatsu and Hiramatsu would be to compensate for the reduction in average power (¶0032 of McGowan).

Re claims 8 and 9, the modified invention of Hiramatsu fails to teach a method wherein the limiting signal is determined by means of a threshold value set for the power or amplitude values, the threshold value being set bearing in mind the maximum value predetermined for an error vector magnitude and for a peak code domain error.

However McGowan teaches wherein a limiting signal (¶0034, a scaling factor) is determined by means of a threshold value set for the power (power regulator 208 in fig. 2, ¶0028) or amplitude values, the threshold value being set bearing in mind the maximum value predetermined for an error vector magnitude and for a peak code domain error (¶0007).

Therefore taking the combined teachings of Hiramatsu, Takada and Hunton with McGowan as a whole, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the step of McGowan into the method of Hiramatsu, Takada and Hunton. The motivation to combine McGowan, Takada, Hunton and Hiramatsu would be to compensate for the reduction in average power (¶0032 of McGowan).

Re claim 10, the modified invention of Hiramatsu fails to teach a method wherein the limiting signal is determined by means of a threshold value set for the power or

amplitude values, the threshold value being set so as to obtain the desired Peak-to-Mean Ratio, Peak-to-Average Ratio, Crest factor of the power or amplitude.

However McGowan teaches wherein a limiting signal (¶0034, a scaling factor) is determined by means of a threshold value set for the power (power regulator 208 in fig. 2, ¶0028) or amplitude values, the threshold value being set so as to obtain the desired Peak-to-Mean Ratio, Peak-to-Average Ratio, Crest factor of the power or amplitude (¶0007, maximum acceptable power signal).

Therefore taking the combined teachings of Hiramatsu, Takada and Hunton with McGowan as a whole, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the step of McGowan into the method of Hiramatsu, Takada and Hunton. The motivation to combine McGowan, Takada, Hunton and Hiramatsu would be to compensate for the reduction in average power (¶0032 of McGowan).

Re claim 25, the claimed limitations recited have been analyzed and rejected with respect to claim 7.

Re claim 26, the claimed limitations recited have been analyzed and rejected with respect to claim 8.

Re claim 27, the claimed limitations recited have been analyzed and rejected with respect to claim 9.

Re claim 28, the claimed limitations recited have been analyzed and rejected with respect to claim 10.

9. Claim 11 rejected under 35 U.S.C. 103(a) as being unpatentable over Hiramatsu (US6701163), Chang (US6628605) and Takada (US20020196876) in view of Dartois (US20020042253).

Re claim 11, the modified invention of Hiramatsu fails to teach a method wherein a second clipping stage is added.

However Dartois teaches a method wherein a second clipping stage (102 in fig. 2) is added after a first clipping stage (101 in fig. 2).

Therefore taking the modified teachings of Hiramatsu, Takada and Chang with Dartois as a whole, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the step of Dartois into the method of Hiramatsu, Takada and Chang. The motivation to combine Dartois, Chang, Takada and Hiramatsu would be to eliminate signal overshots having an amplitude above a predefined threshold (¶0012 of Dartois).

Allowable Subject Matter

10. Claims 19-21, 29-34 and 36-38 are allowed.

11. The following is a statement of reasons for the indication of allowable subject matter:

The allowable subject matter in claim 19 pertains to a means for determining a second error signal using the first limited signal and the second limiting signal, means for generating a second limited signal by reducing the second error signal filtered using the filter matched to a chip pulse waveform from the signal, means for filtering the second limited signal using the pulse shaping filter.

The allowable subject matter in claims 20 and 21 pertain to a means for generating a combined limited signal by combining the filtered limited signals.

The allowable subject matter in claim 36 pertains to a second limiting determiner configured to determine a second limiting signal from the first limited signal filtered using the pulse shaping filter, a second error determiner configured to determine a second error signal using the first limited signal and the second limiting signal, a second generator configured to generate a second limited signal by reducing the second error signal filtered using the filter matched to a chip pulse waveform from the signal and a filter configured to filter the second limited signal using the pulse shaping filter.

The allowable subject matter in claims 37 and 38 pertain to a second generator configured to generate a combined limited signal by combining the filtered limited signals.

Conclusion

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LEON-VIET Q. NGUYEN whose telephone number is (571)270-1185. The examiner can normally be reached on Monday-Friday, alternate Friday off, 7:30AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David C. Payne can be reached on 571-272-3024. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Leon-Viet Q Nguyen/
Examiner, Art Unit 2611

/David C. Payne/
Supervisory Patent Examiner, Art Unit 2611